DRISI

Caltrans Division of Research, Innovation and System Information

Research Results

Maintenance

FEBRUARY 2015

Project Title:
Continued Evaluation of Pothole Patching Equipment, Materials, and Processes

Task Number: 2338

Start Date: July 1, 2012

Completion Date: June 14, 2014

Product Category: Evaluation of new commercial products to determine if they meet Caltrans' need

Task Manager:
Arvern Lofton
Transportation Engineer, Electrical
arvern.lofton@dot.ca.gov

Evaluating Automatic Pothole Patching Equipment

Automated pothole patching machines reduce worker exposure to traffic and improve the repair process

WHAT WAS THE NEED?

The typical pothole repair procedure consists of a maintenance worker quickly moving onto the roadway during a brief traffic break, placing cold patch asphalt into the hole, and retreating after compacting the repair material a few times with a shovel or boot. This manual process directly exposes workers to highway traffic. After two workers were killed in separate incidents while patching highway potholes, Caltrans researched using automated equipment to reduce worker exposure when performing highway patching operations. In a previous project, the Python Pothole Patcher, which automates the traditional hot asphalt patch process, was tested, during which issues arose that required more evaluation to ensure that the Python machine met Caltrans' needs and safety concerns.

WHAT WAS OUR GOAL?

The goal was to have an automated pothole patching machine customized to meet Caltrans specific operational requirements of ease of use, worker safety, and cost efficiency.

Python PHP 5000 Pothole Patcher during testing

Caltrans

Caltrans provides a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability.

Evaluating Automatic Pothole Patching Equipment

Research Results

WHAT DID WE DO?

Caltrans, in partnership with the University of California, Davis Advanced Highway Maintenance and Construction Technology (AHMCT) Research Center, collaborated with Python Manufacturing to resolve various items with its automated Pothole Patcher (PHP), including issues with the machine's drive power train and the conveyor belt systems. The PHP was then successfully deployed in District 4. For example, during one deployment operation, workers were able to fill 75 potholes and seven longitudinal voids in two hours, demonstrating unprecedented pothole patching productivity and efficiency with minimal impact on roadway traffic by using rolling lane closures. The research team also completed a conceptual design of the injection nozzle assembly.

The researchers also investigated other cab-operated products that use a spray patching process: the Rosco RA-300 Spray Patch Machine, the JMK Spray Patcher, and the DuraMaxx Pothole Patcher.

Python automated hot asphalt patching

WHAT WAS THE OUTCOME?

Following a successful 1.5 year deployment trial in San Jose, District 4 maintenance crews were impressed with the PHP's production capabilities while keeping workers off the roadways. However, in July 2013, the unit was removed from service due to safety and handling concerns expressed by Headquarters Maintenance. As a result, the research on this project ended.

Caltrans Maintenance is still interested in obtaining pothole patching equipment for moving-closure mainline pothole repair operations. Caltrans wants to evaluate other commercially available pothole patching equipment that meets California Air Resources Board emission standards.

WHAT IS THE BENEFIT?

Compared to manual pothole patching processes, an automated pothole patching machine increases efficiency and quality, makes rolling highway closure patching operations possible, and minimizes the impact on traffic congestion. By eliminating full lane closures and reducing worker exposure in the roadway, safety is improved for both maintenance staff and motorists.

LEARN MORE

To view the complete report:
http://ahmct.ucdavis.edu/?projects=python-pothole-repair

Manual pothole patching